

WHAT IS CLAIMED IS:

1. A method for treating Hepatitis B virus (HBV) infection, comprising administering a compound that modulates 5 the synthesis or expression of a target cellular gene or the activity of a target protein to a subject in need of such treatment.

2. The method of Claim 1 in which the target gene is a 10 Src kinase.

3. The method of Claim 2 in which the compound is an antisense or ribozyme molecule that blocks translation of the Src kinase.

15

4. The method of Claim 2 in which the compound is complementary to the 5' region of the target gene and blocks transcription via triple helix formation.

20

5. The method of Claim 1 in which the target protein is a Src kinase.

6. The method of Claim 5 in which the compound inhibits the kinase activity of the Src kinase.

25

7. The method of Claim 6 in which the compound is a CsK protein.

8. The method of Claim 6 in which the compound is a 30 tyrphostin-derived inhibitor or a pharmaceutically acceptable salt thereof.

9. The method of Claim 6 in which the compounds is a pyrozolopyrimidine, a derivative thereof or a 35 pharmaceutically acceptable salt thereof.

CROSS-REF'D TO: 6294965
6294966
6294967
6294968

10. The method of Claim 6 in which the compound is a derivative of benzylidenemalonitrile or a pharmaceutically acceptable salt thereof.

5 11. The method of Claim 6 in which the compound is angelomicin or a pharmaceutically acceptable salt thereof.

12. The method of Claim 5 in which the compound interferes with the interaction of Src kinase with other 10 cellular or viral proteins.

13. The method of Claim 12 in which the compound is a dominant-negative mutant of Src kinase.

15 14. The method of Claim 12 in which the compound is a dominant-negative mutant of Fyn, Hck, Yes or another Src kinase family member.

15. The method of Claim 12 in which the compound is a 20 phosphotyrosine containing peptide or a derivative thereof.

16. The method of Claim 1 in which the target protein is HBx.

25 17. A method for treating Hepatitis B virus infection, comprising administering a compound that modulates HBX activities required for viral replication.

18. The method of Claim 17 in which the compound 30 modulates the activation of a Src kinase signaling cascade.

19. The method of Claim 18 in which the compound inhibits or interferes with the activity of a Ras protein.

35 20. The method of Claim 18 in which the compound inhibits or interferes with the activity of a MAP kinase kinase protein.

21. The method of Claim 18 in which the compound inhibits or interferes with the activity of a MAP kinase protein.

5 22. The method of Claim 18 in which the compound inhibits or interferes with the activity of a Myc protein.

23. A pharmaceutical formulation for the treatment of HBV infection, comprising a compound that inhibits activation 10 of a Src kinase, mixed with a pharmaceutically acceptable carrier.

24. A pharmaceutical formulation for the treatment of HBx infection, comprising a compound that inhibits HBx 15 mediated activation of a Src kinase signaling cascade, mixed with a pharmaceutically acceptable carrier.

25. A pharmaceutical formulation for the treatment of HBV infection that inhibits the activities of the HBx gene 20 product essential to sustain the HBV life cycle, mixed with a pharmaceutically acceptable carrier.

26. A method for screening for a potential antiviral agent for the treatment of HBV infection comprising:

25 (a) administering the test compound to a cell expressing HBx;
(b) measuring the enzymatic activity of a component of the Src signaling pathway; and
(c) determining whether the test compound reduces 30 the level of enzymatic activity of the component of the Src signaling pathway,

in which test compounds that result in decreased enzymatic activity of the component of the Src signaling pathway is identified as an antiviral agent.

35 27. The method of Claim 26, the component is a member of the Src family of kinases.

28. The method of Claim 26 in which the component is a Ras protein.

29. The method of claim 7 in which the component is a MAP kinase kinase or MAP kinase.

30. A method for screening for a potential antiviral agent for the treatment of HBV infection comprising:

- 10 (a) administering a test compound to a cell transformed with an HBV pregenome, or a portion thereof;
- (b) incubating the cells for a period of time sufficient to allow for viral replication;
- 15 (c) measuring the cell media for the presence of viral particles; and
- (d) determining if the presence of the test compound results in fewer viral particles into the medium,

in which test compounds that result in fewer viral particles secreted into the medium are identified as antiviral compounds.

31. The method of claim 30 wherein the presence of viral particles is determined by immunoassay.

25 32. The method for screening for a potential antiviral agent for the treatment of HBV infection comprising:

- 30 (a) introducing to a cell the HBx gene product;
- (b) administering to the cell a test compound;
- (c) administering to the cell an agent which induces cell death in response to activated Src kinase; and
- (d) determining whether the presence of the test compound results in increased cell viability,

35 in which test compounds that increase cell viability are identified as antiviral compounds.

33. The method of Claim 32 in which the agent administered to the cell is a tumor necrosis factor.

34. A yeast cell for use in screening agents effective
5 to inhibit HBV infection or replication in a host cell wherein the yeast cell inducibly expresses the Src kinase gene.

35. The yeast cell of claim 34 wherein the cell further
10 expresses the HBx gene.

36. A method for screening for a potential antiviral agent for the treatment of HBV infection comprising,

15 (a) inducing the expression of Src in the yeast cell of claim 34;
(b) administering a test compound to the cell;
(c) measuring the activation of Src kinase; and
(d) determining whether the presence of the test compound reduces the activity of Src kinase,
20 in which test compounds that result in decreased activity of a Src kinase are identified as potential antiviral agents.

37. The method of claim 36 wherein the activation of Src kinase results in cell death.

25

add 9
add EY

30

35